

79. In retail markets, where sellers actively compete in terms of price and conditions of service, market concentration is expected to have a more pronounced effect on market behavior and price-cost margins. Ideally, the HHI measures market concentration in retail markets. Despite its relatively short history, we have sufficient data to calculate HHIs for the leading SDARS providers, as well as market shares based on revenues and subscribers. The following Table presents market shares and HHIs for this emerging market.

TABLE 4
MARKET CONCENTRATION IN SDARS

| | 2002 | 2003 | 2004 | 2005 |
|-------------------------------|-------|-------|-------|-------|
| XM Market Share (Revenue) | 96.1% | 87.7% | 78.5% | 69.7% |
| Sirius Market Share (Revenue) | 3.8% | 12.3% | 21.5% | 30.3% |
| HHI (Revenue) | 9,262 | 7,843 | 6,627 | 5,779 |
| XM (Subscribers) | 92.1% | 83.9% | 73.6% | 64.1% |
| Sirius (Subscribers) | 7.9% | 16.1% | 26.1% | 35.9% |
| HHI (Subscribers) | 8,538 | 7,298 | 6,138 | 5,400 |

Source: Company Annual Reports.¹²¹

80. The above Table shows that the two SDARS providers both have made significant progress in gaining new subscribers. The continuous decline in the HHI measure over the last four years is due to Sinus steadily increasing its share of revenues and subscribers over this period.

E. Market Entry Conditions

1. introduction

81. In this Section we discuss significant factors that affect the ease with which potential participants may enter into satellite communications markets. This discussion includes an assessment of the industry's cost structure. We then evaluate the impact of spectrum allocations and orbital locations on entry and we explain U.S. government policies for market entry by foreign entities. We also review the public policies of foreign administrations about entry into their markets.

82. Entry is the construction of new facilities and/or the offering of service by a participant who was not in the market before. **An** entrant is a new market participant that can add capacity and competition to the relevant market in which it **participates**.¹²² Generally, entry is considered significant if

¹²¹ XM Satellite Radio Holdings, Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 ("XM IO-Ks"); Sirius Satellite Radio, Inc., Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 (Sirius IO-Ks"), both available at <http://www.sec.gov/edgar.shtml> (visited July 12, 2006).

¹²² As the Court of Appeals said in *Federal Trade Commission v. H.J. Heinz Co.*, 246 F.3d 708, 717 n.13 (D.C. Cir. 2001):

"Barriers to entry are important in evaluating whether market concentration statistics accurately reflect the . . . competitive picture. Cf. *Baker Hughes*, 908 F.2d at 987. If entry barriers are low, the threat of outside entry can significantly alter the anticompetitive effects of the merger by

(continued...)

a participant can enter the market within two years from initial planning to significant market impact.¹²³

83. From the beginning of the planning for a new communications satellite to its commencement of service to customers requires more than two years.¹²⁴ Entry relevant to this Report can occur, however, in new satellites that have moved far enough through the entry process that they will begin providing service within two years; by terrestrial wireless and wire-based entrants; and by existing satellites moving their capacity from one product market to another. Examples of the latter are a fixed satellite that began providing capacity for telecommunications backbone, exited that market, and entered the market for network services; and a satellite that began providing service to foreign markets, exited that market, and began providing service to a U.S. market.

84. Barriers to entry into all markets exist, and can range from insignificant to virtually prohibitive. Sources of barriers to entry can be regulatory restraints, strategic behavior by incumbent market participants, and the scarcity of necessary inputs such as natural resources, uncommon human skills, and large amounts of capital. The following Section discusses the cost structure of the commercial satellite industry and its impact on the industry's structure, conduct, and the degree of competition in the industry.

2. Industry Cost Structure

85. The cost structure that typifies an industry influences both the extent of competitive entry and the nature of industry conduct. The cost of production as the output of a firm expands or contracts may significantly affect the extent to which competitors enter a given industry. Additionally, once a firm has committed to enter an industry, certain attributes of the cost of production, especially investment in durable assets used to produce output, will predispose the firm and its competitors toward certain behaviors that will affect the nature of competition observed in the industry.

86. The investment required to enter and operate in virtually any satellite communications markets is substantial, fixed, and largely sunk. The cost of production for any enterprise, including fixed and mobile communications satellite operators, may be classified as either variable or fixed. Variable costs vary directly, either increase or decrease, but not necessarily proportionately, with the quantity of output produced. Examples of such variable costs include hourly labor that varies with the level of production; materials and supplies used in production; electricity consumption; and other variable expenses. Fixed costs do not vary with the quantity of output produced and represent expenditures on inputs of production, including plant and equipment that imply a recurring monthly or annual economic rental rate, *i.e.*, charges for economic depreciation and interest, whether or not anything is produced using such fixed cost assets. In the satellite industry, fixed costs would include the manufacture of a communications satellite or constellation of satellites or the lease of satellite capacity,

87. Often, substantial investment in fixed cost assets is required to enter a market before any output is produced or sold to customers. Moreover, much if not all the substantial investment in fixed cost assets required to enter a new market may be sunk as well as fixed, *i.e.*, the fixed cost asset has no alternative use or economic value beyond the specific investment application required to produce output

(Continued from previous page) _____

detering the remaining entities from colluding or exercising market power. See *United States v. Falstaff Brewing Corp.*, 410 U.S. 526, 532-33, 93 S. Ct. 1096, 35 L. Ed. 2d 475 (1973); *Baker Hughes*, 908 F.2d at 987 ('In the absence of significant barriers, a company probably cannot maintain supracompetitive pricing for any length of time.')."

¹²³ Merger Guidelines § 3.2.

¹²⁴ See Amendment of the Commission's Space Station Licensing Rules and Policies, Notice of Proposed Rulemaking and First Report and Order, 17 FCC Rcd 3847, 3853 n.13 (2002) (quoting *Application of Comsat Corp.*, Order, 12 FCC Rcd 12059, 12075 n.68 (1997).

| | Proxy Variable Cost (\$ millions) ¹²⁶ (1) | Replacement Value of Satellites (\$ millions) (2) | Proxy Fixed Cost ¹²⁷ (\$ millions) (3) | Ratio of Fixed to Total Economic cost [(3)/(1)+(3)] |
|----------|---|--|--|--|
| Intelsat | 438.1 | 8,400.0 | 1,554.0 | 0.78 |
| PanAmSat | 223.1 | 3,300.0 | 610.5 | 0.73 |
| SES | 483.8 | 8,472.0 | 1,567.3 | 0.79 |

89. Additions to investment in satellite capacity also tend to be lumpy or not easily divisible.

¹²⁵ Metrics used are 'operating cost' as a proxy for variable cost and forward-looking 'platform' or network cost as a proxy for fixed cost. Operating expenses are taken from income statements and a weighted average cost of capital ("WACC") and an annual depreciation rate are applied to the estimated replacement value of an operator's satellite fleet to estimate platform cost. Not all data are available for all wholesale operators (for whom satellite capacity is much more 'commoditized' than for retail services) but sufficient data do exist to allow computation of these cost elements. The negotiated, long term contract nature of exchange transactions in this market do not necessitate a substantial base of customer support functions, product advertising and mass marketing so that the ratio of variable costs to the cost of the satellite network itself (including engineering and design cost) is relatively low.

¹²⁶ Operating costs from 2005 Income Statements (in Millions) are taken as a proxy for variable costs.

¹²⁷ Economic rental cost of satellite capacity was estimated based upon the replacement value of the satellite fleet as of 12/31/2005 multiplied by a weighted average cost of capital of 8.5% (the average for the Direct to Home firms as estimated by Bernstein) and an average depreciation rate based on a 12 year design life.

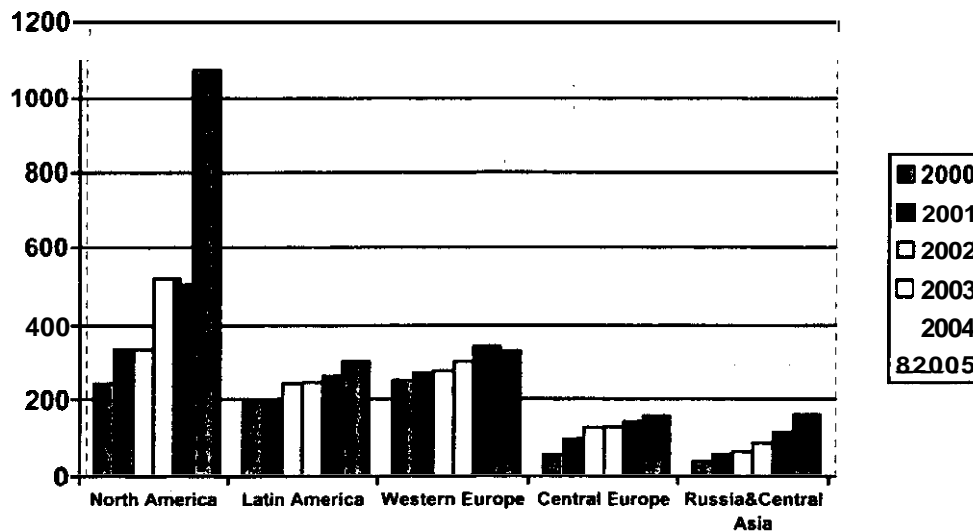
¹²⁸ Intelsat, Ltd., Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 ("Intelsat 10-Ks"), available at <http://www.sec.gov/edgar.shtml> (visited July 12, 2006); PanAmSat Holding Corp., Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 ("PanAmSat 10-Ks"), available at <http://www.sec.gov/edgar.shtml> (visited July 12, 2006); SES, Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 ("SES 10-Ks"), available at <http://www.sec.gov/edgar.shtml> (visited July 12, 2006).

In other words, satellite capacity cannot be augmented one transponder at a time in response to growth in demand for satellite communications services. Rather, given the large sunk cost of launching a **communications Satellite**, it is much more economical to launch a **satellite with transponder capacity sufficient to meet some level** of forecast future demand even though such capacity will substantially exceed current demand levels.

90. In addition to requiring large fixed and **sunk** expenditures, therefore, entry into communications satellite services requires those investments in large increments or "lumps." A new satellite typically introduces much new capacity into the market and thus often creates excess capacity that lasts for a significant time. Charts 1-3, from Euroconsult, track the global "reference supply"¹²⁹ of transponders and global demand, illustrating the persistence of excess capacity through time in the satellite communications industry.

91. Regional data on excess transponder supply provides some insight on the distribution of excess capacity around the globe. Charts 1-3 present a time series of the discrete changes in the excess of transponder supply over demand by world region from 2000 through 2005.¹³⁰ While the aggregation of data within regions may create some distortions, there is a clear consistency across regions of an on-going excess supply, which is consistent with a lumpy capacity expansion process and uncertainty and variability of market demand.

CHARTS 1-2
EXCESS TRANSPONDER SUPPLY BY REGION



¹²⁹ Euroconsult defines "reference supply" as those transponders "that are effectively available for service, taking into account the date of launch, potential movement of satellites between different orbital positions, technical failures, and transponders reserved for failure." Euroconsult, *World Satellite Communication & Broadcasting Markets Survey, Ten Year Outlook*, 12th ed., (Paris, France, Aug. 2005), p. 1.

¹³⁰ In its report, Euroconsult assumes a 36 MHz transponder. The vertical axis of Charts 1-3 represents the number of 36 MHz transponders. *Id.*

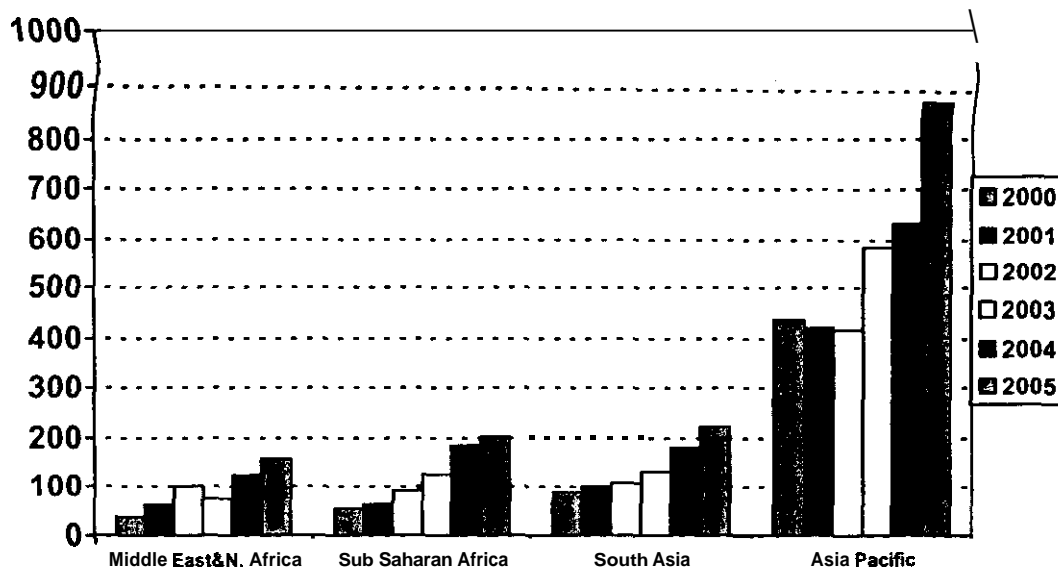
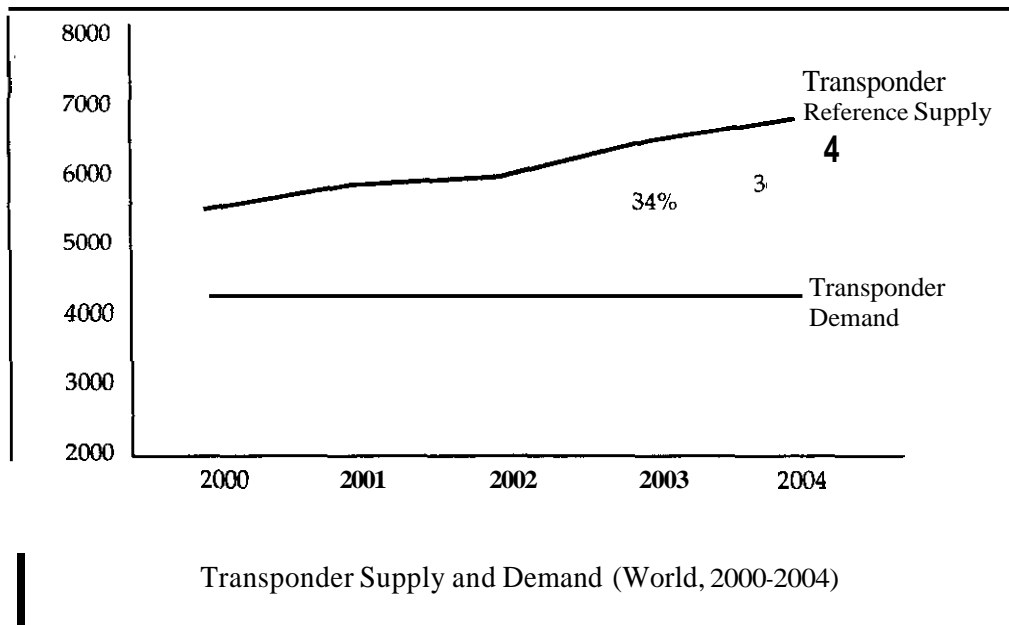


CHART 3

WORLDWIDE TRANSPONDER SUPPLY AND DEMAND



Source for Charts 1-3: *Euroconsult 2006 Report*.

92. The lumpy nature of investment and the consequent recurring excess capacity in the satellite communications industry predisposes satellite communications markets to a certain amount of inherent but predictable economic instability to which satellite operators must and do react. In other words, market equilibrium in the industry will appear to fluctuate as market demand and the extent of excess capacity vary over time. This economic instability is long-standing and well understood within the satellite industry. Satellite communications carriers have to varying degrees successfully managed these market dynamics to ameliorate fluctuations in profitability as a result of capacity and price adjustments and shifts in market demand. To some extent, virtually all competitive markets exhibit fluctuations in

profit, including losses, and unanticipated shifts in demand and prices. These instances of instability do not ordinarily cause otherwise efficient firms to exit the market or seriously impair the long term viability of such business enterprises.

3. Industry Dynamics

93. The discussion in this Section briefly reviews the factors that may contribute to fluctuations in demand that affect most portions of the satellite communications market. Satellite companies are institutionally aware of such shifts in demand and adapt to them by implementing discriminatory or non-linear pricing¹³¹ policies, among other reactive or defensive behaviors.

94. One factor that shifts demand for transponder services is the substitution of fiber optic transmission facilities, both terrestrial and undersea cables, for many satellite transponder services. Demand reduction may be especially sharp when a new fiber optic cable is brought into service, given the huge transmission capacity of modern fiber optic cables. In some cases, however, satellite transponder services complement the transmission services provided by fiber optic transmission facilities by providing path redundancy or backup capacity. This increase in demand may offset to some extent the decline in demand attributable to the substitution of fiber optic facilities for satellite transmission services.

95. Another factor that can shift demand for satellite carriers is the purchasing policy decisions of major customers of satellite transponder services. Such customers include international providers of direct-to-home television services, sizable distributors of video content and U.S. government agencies. Decisions by these significant buyers whether to purchase or renew leases for multiple transponders can result in sharp fluctuations in the overall demand for transponder services.

96. New applications that employ transponder capacity can increase demand for satellite carriers. Growth in consumer demand for multichannel video services, satellite radio, and mobile telephony increases the demand for transponder capacity provided by satellite carriers that offer these retail services and for other satellite carriers that lease capacity to other operators for these services. General macroeconomic conditions, such as the business cycle, will also induce fluctuations in the demand facing satellite carriers.

97. On the supply side, the capacity expansion process can induce economic instability if the demand forecasts supporting the capacity expansion decision turn out to be excessively optimistic. A satellite carrier risks financial losses if its cost structure shifts as a result of expansion of capacity and outpaces the growth in demand. In other words, financial losses can result from both (1) sharp reductions in demand and (2) capacity expansion and shifts in the satellite carrier's cost structure that are predicated on forecast levels of demand that fail to develop or are delayed.

98. Finally, the entry of new satellite carriers can induce some element of instability into the overall market, at least in the short term. The entry of a new, facilities-based satellite operator increases industry supply, which may affect both equilibrium prices and the level of demand facing competitors. The entry of competitors offering innovative services may even, in the long term, enlarge the size of the relevant market or even create new markets.

99. Behavioral Implications. The foregoing discussion describes the market uncertainties faced by satellite carriers, which cause certain observed behaviors to offset these instabilities. These behaviors are interpreted here as defensive reactions to the persistent tendency toward economic instability in various segments of the satellite communications market. This chronic instability appears to

¹³¹ Non-linear pricing refers to the pricing of output that varies with the quantity purchased. Typically, as the quantity purchased of a good or service increases, the unit price of successive units purchased declines. See Robert B. Wilson, *Nonlinear Pricing* (New York: Oxford University Press, 1993).

be rooted in both the nature of the cost structure of satellite carriers and the fluctuating, uncertain demand for various types of transponder services. Most of the following behaviors help stabilize the satellite carrier's business environment and increase the likelihood of financial survival over the longer term. It appears that these behaviors are well established in the industry and seemingly effective in maintaining a measure of predictability and profitability.

100. Non-Linear Pricing. Satellite carriers create specific transponder "services" that effectively segment customers into self-selecting categories with transponder lease rates that reflect willingness to pay. Satellite carriers offer a diverse array of pricing criteria that may take into account quality of service, type and quantity of capacity leased, geographic coverage, and the length of lease period. As a result, price-cost margins will vary markedly between and among different transponder services notwithstanding the marginal cost similarity for most services.

101. Risk-Shifting and Revenue Stabilization. Given the dominance of fixed and **sunk** costs in the cost structure, satellite carriers offer strong financial incentives for customers to absorb some of the satellite carrier's risk of long term capital cost recovery. Satellite carriers offer transponder leases that extend for the operational life of a satellite, such as 15 years, which shifts some of the risk of capital recovery to the customer and stabilizes the cash flow of the satellite carrier. By leasing entire transponders or substantial fractions of a transponder for long periods, the satellite carrier protects against the revenue fluctuations resulting from unpredictable shifts in demand.

102. Mergers. The acquisition of competing satellite carriers not only reduces the number of rivals that the acquiring satellite carrier must face in various market segments and the potential competitive pressure on price-cost margins, but **also** reduces the risk of sudden revenue reduction should a customer not renew a transponder lease and lease instead from a competitor. Beyond realizing potential economies of scale and administrative efficiencies, the post-merger satellite carrier has additional satellite capacity for meeting more diverse customer requirements over a broader geographic area and additional capacity for increasing the level of protection for its transponder services.

103. Vertical Integration. Another strategy for stabilizing revenue for some satellite carriers, especially over the longer term, is vertically integrating into the production of a critical input of production. This strategy helps reduce the risk that the satellite carrier might lose customers should the supply of the critical input be interrupted or unavailable in either sufficient quantity or quality. Thus, a SDARS operator in retail markets may invest in the production of certain programming or commit to long-term contracts for the purchase of programming that it considers to be essential to the building of a profitable subscriber base. In wholesale markets, a satellite carrier may vertically integrate into the production of spacecraft to minimize the hazards of market contracting with spacecraft manufacturers and to insure the timely availability of replacement satellites as a satellite fleet ages or encounters unexpected failures or service interruptions.

104. Service Proliferation. An additional way that a satellite carrier may attempt to stabilize revenue is to broaden the scope of services offered to customers. So long as the additional services tend to complement rather than substitute for existing services, service proliferation can help exploit economies of scope that may be embedded in satellite technology viewed as a multi-purpose platform. Thus, a satellite carrier serving wholesale markets may combine its basic transmission services with network design and management services to offer customers a turnkey, multi-platform network solution that minimizes the technical competence required of the customer. Service proliferation provides a mechanism for the satellite carrier to forge long-term, durable, and flexible relationships with customers that reduces the risk of contract cancellation when the customer's requirements change.

105. Switching Costs. Although long term transponder leases contribute to revenue stability for a satellite carrier dealing with uncertain, fluctuating demand, such leases impose significant switching costs on customers that may want to terminate their transponder service contracts. Customers may also

incur costs if they must re-point earth stations when changing satellite carriers. Taken together, these costs constrain the customer's flexibility to choose a different satellite carrier in response to a change in price or quality of service.¹³²

4. Spectrum Allocation and Orbital Locations

106. In addition to requiring large financial investments, entry into satellite communications requires radio spectrum licenses and orbital slots. The lack of availability of commercial spectrum has the potential to create a significant barrier to entry into markets for commercial satellite communications services.¹³³ While technological advances have steadily increased the ability to fit more users into any given band, radio spectrum remains a finite resource.

107. The Commission has made policy choices that have reduced the potential entry-limiting effects associated with spectrum allocation and assignment. First, in spectrum allocation decisions, the Commission has increased the amount of spectrum available for the provision of satellite communications services over the past 10 years. The Commission has opened Ku-band and Ka-band spectrum for the provision of additional satellite services by non-geostationary satellite orbit service providers, sharing that spectrum with incumbent geostationary satellite services.¹³⁴

108. Second, the Commission has progressively implemented a more flexible, market-oriented model of spectrum assignment for spectrum used to provide commercial satellite services. In the *First Space Station Reform Report and Order*, the Commission substantially revised the procedures for considering license applications, which had been in place since 1983.¹³⁵ The Commission adopted different processing procedures for each of the two kinds of orbits characterizing satellite systems: geostationary satellite orbit ("GSO")-like satellite systems; and non-geostationary satellite orbit ("NGSO")-like systems.

109. For NGSO-like satellites, which include NGSO satellite systems and GSO satellite systems using omni-directional user terminals (such as GSO mobile satellite systems), the Commission uses a modified processing round approach.¹³⁶ When an entity files an NGSO-like application that is not technically incompatible with any licensed system or previously filed NGSO-like application, the Commission issues a public notice inviting interested parties to file competing applications to be considered together with the first application. The Commission then divides the available spectrum equally among the qualified applicants.

110. For most GSO-like satellites, which comprise satellite systems using directional customer terminals, the Commission uses a first-come, first-served approach.¹³⁷ When an entity files a GSO-like

¹³² For a useful overview of the general competitive implications of switching costs and "lock-in" effects, see Massimo Motta, *Competition Policy: Theory and Practice* (Cambridge, UK: Cambridge Univ. Press, 2004), pp. 79-81.

¹³³ One party commenting on the record in this proceeding suggests that satellite spectrum scarcity is the primary barrier to entry by satellite providers. See EchoStar Comments at 6.

¹³⁴ *The Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ku-Band*, Report and Order and Further Notice of Proposed Rulemaking, 17 FCC Rcd 7841 (2002); *The Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ka-Band*, Report and Order, 18 FCC Rcd 14708 (2003).

¹³⁵ *Amendment of The Commission's Space Station Licensing Rules And Policies*, First Report and Order and Further Notice of Proposed Rulemaking, 18 FCC Rcd 10760 (2003) ("First Space Station Reform Order").

¹³⁶ *First Space Station Reform Order*, 18 FCC Rcd at 10774, ¶ 23.

¹³⁷ *Id.* at 10792, ¶ 73.

application that is not technically incompatible with any licensed system or previously filed GSO-like application, the Commission will grant the application if the applicant is qualified without opening a processing round. With this first-come, first-served procedure, the Commission has reduced average processing time for new space station applications from several years to less than four months.¹³⁸

111. The *First Space Station Reform Report and Order* also adopted other measures, including eliminating the satellite "anti-trafficking rule," which had prohibited satellite licensees from selling their licenses at a profit.¹³⁹ License purchasers are usually more willing and able than the sellers to complete construction of the satellite system. Making it easier for licensees to sell their licenses accelerates provision of service to the public. Moreover, eliminating the anti-trafficking rule can lead to a secondary market for satellites. By facilitating satellite licensees to sell unused spectrum to other parties willing to put the spectrum into use, the Commission allows parties flexibility to transfer satellite bandwidth to more efficient uses in response to changing market conditions and consumer demands, thus allowing marketplace forces to determine which companies succeed.

112. The net effect of these new, flexible, and market-oriented spectrum assignment procedures has been to help reduce entry barriers that may arise from government regulation of spectrum.

5. United States Market Entry Standard

a. U.S. Regulatory Policies for Market Entry

113. The United States market for satellite services is open to market entry by foreign satellite operators. The Commission has approved many foreign-licensed satellites for domestic communications,¹⁴⁰ and as discussed above in the Relevant Markets Section, such foreign satellite service providers are active market participants in the U.S.¹⁴¹ In this Section, we review our policies regarding the provision of satellite services to the U.S. as a measure of an open regulatory regime.

114. World Trade Organization. Most satellite services are covered by WTO commitments, namely by the Agreement on Basic Telecommunications ("BTA") that is part of the General Agreement on Trade in Services ("GATS").¹⁴² As part of its commitments under the GATS, the United States made market access commitments for all satellite services, except for Direct to Home ("DTH"), DBS and

¹³⁸ The Commission is currently seeking comment on the appropriate processing framework to apply to DBS applications. See *Amendment of the Commission's Policies and Rules for Processing Applications in the Direct Broadcast Satellite Service, Feasibility of Reduced Orbital Spacing for Provision of Direct Broadcast Satellite Service in the United States*, Notice of Proposed Rulemaking, 21 FCC Rcd 9443 (2006).

¹³⁹ *First Space Station Reform Order*, 18 FCC Rcd at 10841, ¶ 215

¹⁴⁰ Foreign operated satellites listed on the Permitted Space Station List may be accessed by any U.S.-licensed earth station with an ALSAT license. See *Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States*, First Order on Reconsideration ("DISCO II First Reconsideration Order"); 15 FCC Rcd 7207, 7213-16, ¶¶ 13-20 (1999). An unofficial list of satellites on the Permitted Space Station List is available at <http://www.fcc.gov/ibisd/seipermitted.html>.

¹⁴¹ See, e.g., *supra* ¶¶ 40, 49

¹⁴² The GATS is composed of three major components. The first consists of the general obligations and disciplines that apply to all WTO Members. The second includes the specific commitments relating to market access, national treatment, and other commitments that are identified in individual WTO Member Schedules of Specific Commitments. The third contains any exemptions taken by WTO Members from the general obligations that are contained in Article II of the GATS. In addition, all WTO Members must comply with the transparency obligations of Article III of the GATS, which requires prompt publication of all laws and regulations applicable to the provision of services.

SDARS.¹⁴³ The Commission's **DISCO II Order**¹⁴⁴ implemented the satellite market-opening commitments made by the United States in the WTO BTA.¹⁴⁵

115. The **DISCO II Order** sets forth a presumption that entry by WTO Members to provide WTO-covered services would further competition in the United States.¹⁴⁶ As part of the competition analysis, the Commission adopted a presumption that entry by WTO Members to provide WTO-covered services would further competition in the United States.¹⁴⁷ Under this approach, companies from WTO Member countries seeking FCC authorizations to provide WTO-covered services in the U.S. are accorded national treatment (*i.e.*, considered the same as a domestic applicant). In evaluating requests from U.S. earth station operators to access a non-U.S.-licensed space station or in-orbit non-U.S.-licensed satellites to provide space segment capacity service to licensed earth stations in the United States, we apply a public interest framework that considers the effect on competition in the United States, spectrum availability, eligibility and operating requirements, national security, law enforcement, foreign policy and trade concerns.¹⁴⁸

116. **ECO-SAT.** For services from non-WTO Members, or those services for which the United States did not make market access commitments (*i.e.*, DTH, DBS and SDARS),¹⁴⁹ the Commission applies the "effective competitive opportunities for satellites" ("ECO-SAT") analysis.¹⁵⁰ In a merger or other transaction where such services are at issue, the ECO-SAT analysis requires parties to demonstrate that U.S.-licensed satellite systems have effective competitive opportunities to provide analogous services in the non-U.S.-licensed space station's "home market" and, in certain cases, the non-U.S.-licensed space station's "route markets." When the ECO-SAT test is not satisfied, the

¹⁴³ See, e.g., *EchoStar Satellite, LLC For Blanket Authorization to operate 1,000,000 Receive-Only Earth Stations to provide Direct-to-Home Fixed Satellite Service in the United States using the Canadian-authorized ANIK F3 Satellite at the 118.7 W.L. Orbital Location*, Order and Authorization ("**EchoStar Blanket Authorization**"), 20 FCC Rcd. 20083, 20084, -2 (2005).

¹⁴⁴ The U.S. also took an exemption from most-favored nation treatment for these services as well. See *Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Satellites Providing Domestic and International Service in the U.S.*, Report and Order, 12 FCC Rcd 24094 (1997).

¹⁴⁵ The WTO was established pursuant to the *Marrakesh Agreement Establishing the World Trade Organization* ("**Marrakesh Agreement**"), 33 I.L.M. 1125 (1994). The GATS is Annex 1B of the *Marrakesh Agreement*, 33 I.L.M. 1167 (1994). The WTO Telecom Agreement was incorporated in the GATS by the Fourth Protocol to the GATS. 36 I.L.M. 354 (1997).

¹⁴⁶ **DISCO II Order**, 12 FCC Rcd at 24112, 139.

¹⁴⁷ *Id.*

¹⁴⁸ *Id.* at 24107-72, ¶¶ 30-182. In the same Order, the Commission adopted rules for licensed earth station operators to request access to non-U.S. licensed space stations. In the **DISCO II First Reconsideration Order**, 15 FCC Rcd 7207 (1999), the Commission adopted similar rules for in-orbit non-U.S. licensed space stations to provide service to licensed earth station operators in the United States. In-orbit non-U.S. licensed space stations approved by the Commission are placed on the Permitted Space Station list which all routine licensed earth stations may communicate with. **DISCO II First Reconsideration Order** 15 FCC Rcd at 7214, ¶ 16. See also *International Bureau - Permitted Space Station List*, available at <http://www.fcc.gov/ib/sd/se/permitted.html> (visited Aug. 1, 2006).

¹⁴⁹ The United States did not make commitments for market access or most-favored nation treatment for DBS and SDARS. See *Fourth Protocol to the GATS*, 36 I.L.M. at 359. Member nations are permitted to take exemptions under certain circumstances specified in an annex to the GATS. See *GATS Annex on Article II Exemptions*.

¹⁵⁰ **DISCO II Order**, 12 FCC Rcd at 24127-37, ¶¶ 72-101; 47 C.F.R. § 25.137(a).

¹⁵¹ *Id.* (both)

Commission will prohibit a satellite system from serving the U.S. market, unless there is a compelling public interest reason to do otherwise.¹⁵² Specifically, the Commission considers "whether any additional countervailing public interest factors weigh in favor of a result different from the one we would reach under the ECO-SAT analysis alone."¹⁵³ In applying the ECO-SAT analysis to a small number of recent applications relating to services for which the U.S. did not make market access commitments, the Commission has determined that there were compelling public interest reasons to permit access to a non-U.S.-licensed space station despite the presence of a *de jure* barrier to entry in the non-U.S.-licensed space station's home market.¹⁵⁴

b. New International Entrants to U.S. Markets

I 17. FSS. Following U.S. adoption of the WTO Basic Telecom Agreement in 1997, the Commission, in its *DISCO II* decision, established a Permitted Space Station List procedure by which non-U.S. licensed satellite operators providing FSS in the C- and Ku-bands might acquire authority to provide space segment capacity in the United States.¹⁵⁵ Permitted Space Station List operators include Telesat Canada,¹⁵⁶ Satelites Mexicanos, S.A. de C.V.,¹⁵⁷ New Skies Satellites N.V.,¹⁵⁸ Spacecom Satellite Communications Services (Israel),¹⁵⁹ Embratel (Brazil),¹⁶⁰ Loral Skynet do Brasil,¹⁶¹ Eutelsat,¹⁶² Hispasat

¹⁵² *Amendment of the Commission's Regulatory Practices to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the U.S.*, Notice of Proposed Rulemaking ("DISCO II NPRM"), 11 FCC Rcd 18178, 18192, ¶ 38 (1996).

¹⁵³ See, e.g., *EchoStar Blanket Authorization*, 20 FCC Rcd at 20087-88, ¶ 11 (citing *DISCO II NPRM*)

¹⁵⁴ See *EchoStar Blanket Authorization*, 20 FCC Rcd at 20087-88, ¶¶ 10-11, and 20089, ¶ 14 (notwithstanding Canadian regulations prohibiting use of U.S.-licensed space stations to offer one-way subscription video programming service to Canadian public, use of Telesat Canada's ANIK F3, a Canadian-licensed satellite, to receive DTH FSS provided public interest benefits by facilitating EchoStar's ability to provide coverage to Alaska and Hawaii and might promote competition for enhanced programming in those states).

¹⁵⁵ *DISCO II Order*, 12 FCC Rcd at 24094; *DISCO II First Reconsideration Order*, 15 FCC Rcd at 7207. Also, as discussed in Section III E 4 of this report, the *DISCO II* proceeding adopted the ALSAT procedure permitting U.S. earth station licensees to access particular non-U.S. licensed satellites without further approval, provided that the earth station complies with the Commission's technical requirements and operates under the conditions of its license.

¹⁵⁶ See *Telesat Canada. Petition for Declaratory Ruling for Inclusion of ANIK F1 on the Permitted Space Station List*, File No. SAT-PDR-20000420-00083, Order, 15 FCC Rcd 24828 (2000); See *Telesat Canada, Petition for Declaratory Ruling for Inclusion of ANIK F2 on the Permitted Space Station List and Petition to Serve the U.S. Market Using Ka-band Capacity on Anik F2*, 17 FCC Rcd 25287 (2002).

¹⁵⁷ See *Satelites Mexicanos, S.A. de C.V., Petition for Declaratory Ruling*, Order, 15 FCC Rcd 19311 (2000), *erratum*, 19 FCC Rcd 20427 (2004).

¹⁵⁸ See *New Skies Satellites N.V., Petition for Declaratory Ruling*, Order, 16 FCC Rcd 6740 (2001); *New Skies Satellites N.V., Petition for Declaratory Ruling*, Order, 17 FCC Rcd 10369 (2002). In 2006, SES Global acquired New Skies. *New Skies-SES GLOBAL*, 21 FCC Rcd 3194 (2006).

¹⁵⁹ See *Spacecom Satellite Communications Services S.C.C. Ltd, Petition for Declaratory Ruling for Inclusion of AMOS-2 on the Permitted Space Station List*, File No. SAT-PDR-20020823-00161; Order, 18 FCC Rcd 14433 (2003).

¹⁶⁰ See *Empresa Brasileira de Telecomunicações S.A., Petition for Declaratory Ruling on Access to Brasilsat A2 Satellite via U.S. Earth Stations*, File No. SAT-PDR-20000111-00047, Order, 16 FCC Rcd 655 (2001).

¹⁶¹ See *Loral Skynet do Brasil, Petition for Declaratory Ruling to Add Estrela do Sul 1, a Ku-band Satellite, to the Permitted Space Station List*, File Nos. SAT-PDR-20021010-00196, SAT-WAV-20031202-00352, and S2474, Order, DA 03-4095 (rel. Dec. 23, 2003).

S.A. (Spain),¹⁶³ Horizons Satellite LLC (Japan),¹⁶⁴ Mabuhay Philippines Satellite Corp.,¹⁶⁵ Binariang Satellite Systems SDN BHD (Malaysia),¹⁶⁶ and Intelsat.¹⁶⁷

6. Public Policies of Foreign Administrations

118. Satellites, more than any other technology platform, are technically well suited to provide communications services to a wide geographic area. “[D]ue to the flexible nature of satellite coverage, each satellite can cover various countries and can be available to all those countries within its footprint.”¹⁶⁸ Moreover, some satellite capacity can be relocated from one geographic region to another to respond to service demand.¹⁶⁹ While a particular satellite-delivered service may be technically available in any particular nation, the laws and regulations of individual nations will determine whether the service may be commercially offered.” These policies may be specific to the satellite communications services sector or more generally applied to the entire communications sector, or even represent conditions applied to a broad scope of commercial activities. Such policies may, by their nature, affect the ability of individual firms to enter the market.”

119. In directing the Commission to prepare this Report, Congress requested that the Commission compile “a list of any foreign nations in which legal or regulatory practices restrict access to the market for satellite services in such nation in a manner that undermines competition or favors a

(Continued from previous page) _____

¹⁶² See *European Telecommunications Satellite Organization (EUTELSAT), Petition for Declaratory Ruling to Add EUTELSAT Satellites ATLANTIC BIRD™ 1 at 125° W.L. and ATLANTIC BIRD™ 2 at 8° W.L. to the Commission's Permitted Space Station List*, File Nos. SAT-PDR-I0010118-00011 and SAT-PDR-20010207-00012, Order, 16 FCC Rcd 15961 (2001).

¹⁶³ See *Hispasat S.A., Petition for Declaratory Ruling for Inclusion of Hispasat-IB on the Permitted Space Station List*, File No. SAT-PDR-20020208-00016, Order, 18 FCC Rcd 3277 (2003); *Hispasat S.A., Petition for Declaratory Ruling to Add HISPASAT-1D Satellite at 30° W.L. to the Permitted Space Station List*, File No. SAT-PDR-20030430-00090, Order, 18 FCC Rcd 21142 (2003).

¹⁶⁴ See *Horizons Satellite LLC, Petition for Declaratory Ruling to Add Horizons 1 to the Permitted Space Station List*, File No. SAT-PDR-20030210-00015, Order, 18 FCC Rcd 24745 (2003); *Horizons Satellite LLC, Application for Modification of Permitted List Authorization*, File No. SAT-PPL-20040112-00004, Order and Authorization, 19 FCC Rcd 20349 (2004) (permitting one-way DTH service).

¹⁶⁵ See *Mabuhay Philippines Satellite Corp. Petition for Declaratory Ruling, et al.*, Order and Authorization, 15 FCC Rcd 23671 (2000).

¹⁶⁶ See *Binariang Satellite Systems SDN BHD, Petition for Declaratory Ruling to Add MEASAT-2 to the Permitted Space Station List*, File No. SAT-PDR-20030501-00091, Order, 18 FCC Rcd 16623 (2003).

¹⁶⁷ See *Loral Spacecom Corporation, Petition for Declaratory Ruling to Add Telstar 13 to the Permitted Space Station List*, File No. SAT-PDR-20020315-00025, Order, 18 FCC Rcd 16374 (2003). Intelsat acquired Telstar 13 from Loral Spacecom Corporation in 2004, and operates it as IA-13. *Loral Soellite, Inc. and Loral Spacecom Corp., Assignors and Intelsat North America, LLC, Assignee*, Order and Authorization, 19 FCC Rcd 2404 (2004).

¹⁶⁸ SIA Comments at 6-7 (*quoting* FCC, 2004 Section 43.82 Circuit Status Data, at 4 n.12 (Dec. 2005)).

¹⁶⁹ *Id.* at 7.

¹⁷⁰ See, e.g., International Telecommunication Union, ITU-D Study Group 1, Rapporteur For Question 1711, *Satellite Regulation In Developing Countries, Report on Satellite Regulation In Developing Countries* (2004) (“ITU-D Satellite Regulation Report”) at 7-8.

¹⁷¹ The United States Trade Representative (USTR) explains that “[t]rade barriers or other trade distorting practices affect **US** exports to another country because these measures effectively impose costs on such exports that are not imposed on goods produced domestically in the importing country.” 2006 NTE Report, Foreword.

particular competitor or set of competitors.”¹⁷² As directed to by Congress, we have requested comment on “the legal or regulatory practices of foreign nations which have the effect of restricting access to that nation’s market for satellite services.” We also asked commenters to tell us “what types of legal or regulatory practices hinder U.S. firms from fully participating in a given foreign market” and if there are “legal or regulatory practices that favor a particular competitor or set of competitors.”¹⁷³

a. Executive Branch

120. The Commission is an independent regulatory agency tasked primarily with implementation of the Communications Act. As such its expertise is related primarily to regulation of domestic communications services or international communications that originate or terminate in the United States. Moreover, the Commission does not represent the United States government in its formal relations with other sovereign nations, although it does provide assistance in areas of its expertise.

121. Any review of the legal or regulatory practices of a foreign nation raises issues intimately related to the trade relationships of the United States with other sovereign nations. Foreign relations, including communications-related agreements, are the province of Executive Branch agencies. It is beyond the role of the Commission to determine whether foreign nations’ laws and regulations are or are not in compliance with any obligations under trade agreements with the United States or other international law. The discussion in this Section (and Appendix B), therefore, does not represent the views of the Executive Branch.

b. Market Access Standard

122. In carrying out Congress’ direction to identify those nations with legal or regulatory practices that restrict access to their markets for satellite services, we first must determine what standard we will apply to describe which practices do in fact restrict access for satellite services “in a manner that undermines competition or favors a particular competitor or set of competitors.”¹⁷⁴

123. In the Notice, we invited comment on this issue. Three parties filed comments that addressed this Section of the report. In implementing Congress’ direction, we also look to the United States’ rules for reviewing entry to the U.S. market to evaluate whether or not legal or regulatory practices in other nations restrict access to foreign markets in a manner that undermines competition or favors a particular competitor or set of competitors.¹⁷⁵

(i) Comments

124. SIA filed comments describing the practices that they assert non-WTO Member nations should adhere to in order to gain accession to the WTO or that current WTO Member nations should adopt if they have not yet done so. SIA recommends that the Commission consider whether a nation (1) provides for transparent, non-discriminatory and timely licensing procedures; (2) provides for national treatment (*i.e.*, most favored nation status); and (3) permits the transport of broadcast video signals and associated audio signals. SIA also recommends that the Commission ensure that a nation does not require as a prerequisite to entry (4) local presence; (5) completion of the International Telecommunications Union (“ITU”) frequency coordination process; or (6) the deployment of any particular technology. In addition, SIA also states that (7) no special monopoly status should be afforded to incumbent

¹⁷² 47 U.S.C. § 47 U.S.C. § 703(b)(3).

¹⁷³ Notice at 5.

¹⁷⁴ 47 U.S.C. § 703(b)(3).

¹⁷⁵ See *supra* § III.E.5.

telecommunications operators or satellite systems.¹⁷⁶

125. In its comments, Stratos Global Corporation (“Stratos”) asserts that while seeking regulatory approval to provide Inmarsat’s mobile satellite services it has encountered **barriers** “in many, if not a **majority** of the world’s **countries**.”¹⁷⁷ Stratos states that many countries continue to protect the monopoly operations of incumbent providers and prevent competitive entry either through legal and regulatory practices that have that effect or through the lack of an applicable regulatory scheme.¹⁷⁸ Stratos asserts that many countries do not permit competitors to sell MSS services or impose local ownership requirements and/or exorbitant licensing **fees**.¹⁷⁹

126. Finally, EchoStar commented that Canada has imposed legal and regulatory barriers to entry into the Canadian satellite television market that include foreign ownership restrictions, rules controlling the amount of U.S. and Canadian content carried on Canadian satellites and restrictions on the distribution of U.S. content to Canadian **consumers**.¹⁸⁰

127. We also reviewed USTR’s National Trade Estimate Report on Foreign Trade Barriers (“NTE Report”), which documents foreign trade and investment barriers and **U.S.** efforts to reduce and eliminate those **barriers**.¹⁸¹

128. The NTE Report covers significant trade barriers whether they are consistent or inconsistent with international trading **rules**.¹⁸² The NTE considers trade barriers to include “government laws, regulations, policies, or practices that either protect domestic products from foreign competition or artificially stimulate exports of particular domestic **products**.”¹⁸³ In the 2006 NTE Report, a number of foreign nations are cited for several types of market barriers to satellite, including (1) a lack of commitments in trade agreements for market access or national treatment for satellite services; (2) requirements for foreign operators to partner with local entities or otherwise establish a local presence; (3) restrictions on DTH or other satellite-delivered content business; and (4) restrictions on foreign ownership in satellite operators or related businesses.

¹⁷⁶ SIA Comments, An. 1 at 3-4.

¹⁷⁷ Stratos Comments at 1.

¹⁷⁸ *id.* at 2.

¹⁷⁹ *id.* at 2-3.

¹⁸⁰ EchoStar Comments at 6.

¹⁸¹ USTR is required to submit an annual report on significant foreign trade barriers to the President, the Senate Finance Committee, and appropriate committees in the House of Representatives in accordance with section 181 of the Trade Act of 1974, as amended by section 303 of the Trade and Tariff Act of 1984, section 1304 of the Omnibus Trade and Competitiveness Act of 1988, section 311 of the Uruguay Round Trade Agreements Act, and section 1202 of the Internet Tax Freedom Act. The NTE Report is based upon information compiled within USTR, the U.S. Departments of Commerce and Agriculture, and other U.S. Government agencies, and supplemented with information provided in response to a notice in the Federal Register, and by members of the private sector trade advisory committees and U.S. Embassies abroad. 2006 National Trade Estimate Report on Foreign Trade Barriers (“2006 NTE Report”), Foreword.

¹⁸² Many barriers to **U.S.** exports are consistent with existing international trade agreements. On the other hand, where measures are not consistent with international rules, they are actionable under U.S. trade law and through the World Trade Organization. 2006 NTE Report, Foreword.

¹⁸³ *id.*

(iii) Discussion

129. We find that the Commission's rules for foreign-licensed satellite providers to operate in the United States provide a reasonable benchmark for evaluating whether foreign nations' requirements for entry into their satellite markets have the effect of restricting access to that nation's market for satellite services. The Commission's rules incorporate both the commitments made by the United States as a part of its WTO membership and a process for evaluating entry by non-WTO Member nations. Although the United States does evaluate non-WTO Member nations (and all foreign nations with regards to non-WTO-covered services) for equivalent competitive opportunities for entry for U.S. operators, the United States' baseline requirements for foreign entry to the United States' satellite markets do not restrict or preclude meaningful participation by foreign operators nor do our rules favor a particular competitor or set of competitors.¹⁸⁴

c. Market Access Findings

130. In this proceeding, we did not receive extensive comment regarding foreign market barriers to U.S. licensed satellite operators. We did receive illustrative information regarding the types of barriers satellite companies assert exist in various foreign nations from SIA (a U.S.-based trade association representing satellite operators, service providers, manufacturers, launch services providers, remote sensing operators and ground equipment suppliers). SIA asserts that its Comments provide an "industry-wide consensus perspective on certain selected issues raised by the Public Notice."¹⁸⁵ In addition, Stratos described legal and regulatory obstacles encountered by mobile satellite service providers when seeking to enter foreign markets, and EchoStar described specific restrictions on the provisions of DBS services to Canada. We find these comments expressed several common categories of legal or regulatory policies that restrict access to foreign markets. We received no comments in opposition to these comments. Moreover, we find that the comments are not in conflict with stated approaches to market access issues for satellite services by USTR or the Commission. We find, therefore, that these general observations regarding foreign nations' market barriers are consistent with the standard for review of foreign satellite markets we have chosen to use in this Report.

131. Based on our standard and the record in this proceeding, we identify six broad types of market barriers established by foreign nations that preclude entry by U.S. satellite operators or satellite service providers.¹⁸⁶ Some barriers relate generally to the commercial or procedural conduct of countries' regulatory regimes, such as: a lack of transparent, non-discriminatory and timely licensing procedures; and no national treatment (*i.e.*, Most Favored Nation status) provided for U.S. satellite operators. Other barriers relate to legal or regulatory practices that are specific to satellite services, such as: prohibitions on U.S. satellite operators transporting broadcast video signals and associated audio signals; requirements

¹⁸⁴ With regards to non-WTO Members and non-WTO-covered services, only if the United States finds that a foreign nation's requirements do not provide to U.S. operators equivalent competitive opportunities to the baseline U.S. market requirements, does the United States restrict entry by foreign satellite operators.

¹⁸⁵ SIA Comments at 1. SIA lists as executive members: Artel, Inc., The Boeing Company, The DirecTV Group, Globalstar LLC, Hughes Network Systems LLC, ICO Global Communications, Integral Systems, Inc., Intelsat, Ltd., Iridium Satellite LLC, Lockheed Martin Corp. Loral Space and Communications Inc., Mobile Satellite Ventures LP, Northrop Grumman Corp., PanAmSat Corp., SES Americom, Inc., and TerreStar Networks, Inc., and as associate members: ATK, Inc, EMC Inc, Eutelsat, Inc, Inmarsat plc., IOT Systems, Marshall Communications Corp., New Skies Satellites Inc., Spacecom Corp., and Stratos Global Corp. *Id.* at n.2.

¹⁸⁶ NTE groups trade barriers into ten different categories: (1) Import policies; (2) Standards, testing, labeling and certification; (3) Government procurement; (4) Export subsidies; (5) Lack of intellectual property protection; (6) Services barriers; (7) investment barriers; (8) Anticompetitive practices; (9) Trade restrictions affecting electronic commerce; and (10) Other barriers. 2006 NTE Report, Foreword.

that U.S. satellite operators establish a local presence or obtain a local partner; requirements for completion of the ITU frequency coordination process prior to granting market access for U.S. satellite operators; and explicit monopolies for a country's domestic satellite operator over a U.S. operator.

Appendix B to this Report includes a list of the nations commenters identified in the record as engaging in one or more of the following market barriers to entry by U.S. satellite providers.

132. Lack of Transparent, Non-Discriminatory and Timely Licensing Procedures. SIA asserts that licensing procedures should be streamlined, transparent, and timely, and recommends that licensing procedures should be the same for satellite earth stations, mobile satellite handsets and all terminal equipment accessing domestic or foreign satellite systems.¹⁸⁷ Stratos states that even where application by competing providers is permitted, some countries impose exorbitant licensing fees.¹⁸⁸

133. No National Treatment (i.e., Most Favored Nation Status) for United States Satellite Operators. SIA asserts that foreign nations should not make exemptions to or otherwise place limitations on Most Favored Nation treatment that would put U.S. satellite operators at a disadvantage.” In the 2006 NTE, USTR noted those foreign nations that took exemptions for market access or national treatment for satellite services under the WTO or another trade agreement.¹⁹⁰

134. Prohibitions on U.S. Satellite Operators Transporting Broadcast Video Signals and Associated Audio Signals. SIA asserts that foreign nations should permit U.S. satellite operators to transmit video programming and any associated audio signals.” EchoStar notes that Canada has imposed several barriers to entry into its satellite television market that include restrictions on foreign ownership and content as well as rules limiting the use of Canadian satellites.¹⁹² In the 2006 NTE, USTR noted those foreign nations that impose restrictions on satellite-delivered content businesses.¹⁹³

135. Requirements for Local Presence or a Local Partner. SIA notes that a foreign satellite operator is not required to establish a local company or presence in the United States in order to be added to the Permitted Space Station List. SIA and Stratos assert that foreign nations similarly should not impose local requirements on U.S. satellite operators.¹⁹⁴ In the 2006 NTE, USTR noted those foreign nations that require U.S. satellite operators to partner with local entities or otherwise establish a local presence.”

¹⁸⁷ SIA Comments, App. A at 3.

¹⁸⁸ Stratos Comments at 3.

¹⁸⁹ SIA Comments, App. A at 3.

¹⁹⁰ USTR noted that both the Philippines and Columbia had not made commitments for various satellite services under the **WTO . 2006 NTE Report** at 173, 531.

¹⁹¹ SIA Comments, App. A at 4.

¹⁹² EchoStar Comments at 5-6.

¹⁹³ USTR cited Brazil for subjecting foreign satellite television programmers to an 11 percent remittance tax unless the programmer invests 3 percent of its remittances into co-production of Brazilian audio-visual services. **2006 NTE Report** at 45. USTR cited Singapore for restricting the use of satellite receiving dishes and has not authorized direct to user satellite television services. *Id.* at 602. USTR cited Canada and Korea for restricting the retransmission of foreign programming. *Id.* at 76,408.

¹⁹⁴ SIA Comments at 3 and Stratos Comments at 3-4, Appendix A. *See also ITU-D Satellite Regulation Report* at 20, 67.

¹⁹⁵ USTR noted that India requires foreign satellite operators to have an Indian partner and that Russia requires foreign satellite operators to have a local presence. **2006 NTE Report** at 325, 559. In addition, the Russian Federation maintains a preference for the use of Russian satellite communications systems. *Id.* at 557.

136. Requirements for Completion of the ITU Frequency Coordination Process Prior to Granting Market Access. SIA notes that the United States does not require an applicant to complete international coordination before granting that applicant's satellite system authorization. Rather, the authorization is conditioned with a requirement to undertake ITU coordination.¹⁹⁶ If a satellite operator has received a license for its space segment from its home country and has coordinated through the ITU, a foreign nation should not impose a duplicate licensing requirement to provide services in that country.¹⁹⁷

137. Monopolies for Domestic Satellite Operators or Service Providers. SIA asserts that foreign nations must not afford any special monopoly status to incumbent telecommunications operators or satellite systems. Foreign nations must permit U.S. satellite operators to sell space segment capacity directly to any licensed earth station operator.¹⁹⁸

F. Effect of Technology Change on Market Structure

138. Technology innovation plays a critical role in the state of competition within specialized telecommunications industries such as the commercial satellite communications sector. Advances in spacecraft technology, associated ground equipment, or in satellite services applications can dramatically affect the competitiveness of satellite as a delivery platform versus other wired or wireless platforms, and the strategic competitiveness of one firm versus another within the satellite industry. Additionally, technological changes can permit the market entry of new service providers utilizing different technology platforms, such as satellite.

1. Spectrum-Efficient Technology

139. Recent technology advances – in particular spot beam technology and powerful data compression algorithms – have enabled more efficient use of spectrum, thereby increasing the number of satellite providers that may effectively participate in a given market. Spot beams are small-footprint satellite beams that are focused on relatively limited portions of the Earth, thereby allowing multiple frequency reuse through spatial isolation (multiple beams).¹⁹⁹ Initially, spot beams were used to conserve on-board power while serving areas outside the main-beam (e.g., the waters around Hawaii). More recently, spot beam technology in combination with advanced on-board, or ground-based, processing has permitted satellites to migrate to all-spot beam architectures. This design permits efficient reuse of spectrum and allows for the delivery of regional services.

140. Data compression is the process of encoding data to reduce redundancy, thus increasing effective data density and reducing required transmission bandwidth. Data compression is accomplished by providing a coding scheme at each end of a communications link that allows characters to be removed at the transmitting end of the link, and replaced at the receiving end. Data compression techniques continue to yield higher data rate services within a given bandwidth.²⁰⁰

141. Some other significant examples of increased technical efficiency in satellite

¹⁹⁶ SIA Comments, Appendix A at 3.

¹⁹⁷ See *ITU-D Satellite Regulation Report* at 20, 67.

¹⁹⁸ SIA Comments, Appendix A at 4. See also Stratos Comments at 3.

¹⁹⁹ Typically, 20-30 Ku-band spot beams are used to provide coverage of the entire USA. At Ka-band, spot beam diameters may be small and capable of tighter targeting of designated metropolitan areas. See, e.g., Fred Dawson, "Next Generation FSS May Prove Formidable," CED (May 1, 1997), available at <http://www.cedmagazine.com/article/ca6261705.html> (visited Nov. 1, 2006); Jeffrey Krauss, "Sorting Out The Satellite Confusion," CED (July 1, 1997), available at <http://www.cedmagazine.com/article/ca6261652.html> (visited Nov. 7, 2006).

²⁰⁰ See Owen D. Kurtin, "Dollars & Sense: A Closer Look: DVB And IPTV," *Satellite Today* (July 1, 2006), available at <http://www.satellitetoday.com/cgi/pub/via/via07010607.html> (visited Nov. 7, 2006).

communications include: error detection/correction coding²⁰¹ and higher-order modulation techniques (e.g., 8PSK,²⁰² 16-QAM²⁰³) permitting significant increases in data rates within a given spectrum bandwidth (higher bit/s/Hz); and demand assignment²⁰⁴ techniques that maximize the number of satellite users that can access a given resource.

2. On-Board Processing

142. On-board processing is a general term that refers to signal processing functions implemented on-board the satellite that go beyond the amplification and frequency conversion performed in conventional, bent-pipe satellite systems, to include any number of additional functions like demodulation, multiplexing, switching or routing. On-board processing payloads can function as intelligent signal routers and switches, directing traffic between spot beams in a satellite or to another satellite within the operating constellation. This capability enables wide regional or even global single-hop connectivity between earth stations. Moreover, they are able to adapt quickly to changing data throughput and system loading demands. On-board processing systems can achieve the higher service speed, throughput capacity and full-mesh connectivity necessary for peer-to-peer communications. In addition, low-Earth orbit (“LEO”) systems require sophisticated position and pointing capabilities, satellite-to-satellite handover control, and beam-to-beam handover control functions which may also be performed on-board.

143. Despite its many advantages, on-board processing is not achieved without significant increases in satellite payload cost and complexity. Moreover, because on-board processed systems are generally tailored to a specific application, they are less able to adapt to changes in the operator’s business model.

IV. MARKET CONDUCT

144. In this Section, we explore a variety of factors that may influence ~~firm~~ conduct and decision-making in satellite communications markets. Because fixed and sunk costs are a prominent attribute throughout the satellite industry, we explore the types of economic costs evident in both wholesale and retail markets. We also contrast the means by which prices are set in both the wholesale and retail markets, and the extent to which firms compete in price alone or on both price and product quality.²⁰⁵

145. In general, we find differing conduct in the wholesale and retail satellite markets. For

²⁰¹ In error detection and correction coding, each data signal conforms to specific rules of construction (code) so that departures from this construction in the received signal can generally be automatically detected and/or corrected.

²⁰² Phase-shift keying (“PSK”) is a digital modulation scheme that conveys information by changing, or modulating, the phase of the reference carrier wave. In 8-PSK, eight distinct phases are used, each corresponding to a unique pattern of binary data bits.

²⁰³ Quadrature amplitude modulation (“QAM”) is a modulation scheme which conveys information by changing the amplitude of two carrier waves that are out of phase with each other by 90°. In 16-QAM, sixteen discrete modulation symbols are represented by various combinations of the relative amplitudes of each of the two quadrature waves.

²⁰⁴ Demand assignment refers to the assignment of varying amounts of capacity to particular users depending upon their fluctuating traffic requirements. When multiple users share a communication channel on a real-time basis, demand assignment optimizes channel capacity utilization at the expense of system complexity.

²⁰⁵ For further discussion, see John Sutton, *Sunk Costs and Market Structure: Price Competition, Advertising, and the Evolution of Concentration* (Cambridge, MA; MIT Press, 1991).

wholesale markets, firms tend to invest heavily in the network costs of acquiring the satellite-based infrastructure required to enter the communications satellite market. As a result, carriers competing in wholesale markets generally compete on the basis of price. For retail markets, firms tend to invest more in marketing, additional programming, and other operational costs to increase the consumer's willingness to pay for the firm's output compared to what is offered by competitors.

A. Wholesale Markets

146. In wholesale satellite communications markets, the conduct of market participants is significantly influenced by non-discretionary investments required to build a satellite-based infrastructure or procure satellite transponder capacity. These economic costs, which may be broadly categorized using the accounting terms as "network costs," include the investment in engineering, design and manufacture of spacecraft, launch vehicle services, transponder lease contracts, network control and ground support services.²⁰⁶ These costs tend to be determined by technology and are essential to market entry; in economic terms, they are considered "sunk" costs that are not easily transferred.²⁰⁷

147. For wholesale markets, these non-discretionary "network" costs tend to exceed other discretionary investments, such as the "operating costs" of advertising or marketing expenditures that are more prevalent in retail markets.²⁰⁸ Unlike satellite carriers delivering retail services directly to customers, wholesale satellite carriers face a relatively small number of specialized buyers whose needs and demands remain relatively consistent. Further, the negotiated, long-term contract nature of exchange transactions in this market tends not to require investment in a substantial base of customer support functions, product advertising, and mass marketing.

148. Table 6 sheds some light on the relative ratio of network costs versus operating costs, using publicly available company financial data for 2001-2005. Not all data are available for all satellite operators, but sufficient data do exist to allow computation of rough proxies for economic costs using network and operating sunk costs. We note that the data utilized in this Table pre-dated the subsequent mergers of Intelsat with PanAmSat and SES with New Skies.

²⁰⁶ We note that accounting costs are not strictly equivalent to economic costs. Accounting costs are historical, where economic costs are future-oriented, reflecting the opportunity cost of using an input of production, such as labor, materials, or durable assets in a particular application.

²⁰⁷ These 'sunk' costs are predominately 'fixed' costs. Network costs tend to be totally fixed in that they do not vary with output, while the operating costs are largely fixed in nature, but may vary to some extent with the level of production, i.e., programming expenditure.

²⁰⁸ Operating costs or expenses are accounting costs related to the production of goods or services sold, such as R&D and sales and marketing; see G. Porter and C. Norton, *Financial Accounting*, Second Edition (Dryden Press: 1995), 560-61.

TABLE 6
RATIO OF OPERATING TO NETWORK SUNK COSTS

| Satellite Carrier | Estimated Replacement Cost of Satellites (\$ millions) | Weighted Average Cost of Capital @8.5% Per Annum | Depreciation@ 8.3% Per Annum (\$ millions) | Estimated Network Cost ²¹⁰ (\$ millions) | Ratio of Operating to Network Costs ²¹¹ |
|-------------------|--|--|--|---|--|
| Intelsat | 8,400.0 | 714.0 | 840.0 | 1,554.0 | 0.098 |
| PanAmSat | 3,300.0 | 280.5 | 330.0 | 610.5 | 0.184 |
| SES | 8,472.0 | 720.1 | 847.2 | 1,567.3 | N/A |
| New Skies | N/A | N/A | N/A | N/A | N/A |

149. For wholesale markets, the Table shows that network costs dominate the cost structure.

150. Price Competition. Wholesale satellite markets reveal a pricing behavior that primarily reflects bilateral negotiations or bargaining between the customers and satellite carriers. Given the highly specific circumstances surrounding any particular negotiation between a satellite carrier and a wholesale customer, it is difficult to model general bargaining behavior in a way that is representative of behavior for all satellite carriers and all wholesale customers.²¹³ It is possible, however, to identify certain

^{2w} Operating expenses are taken from income statements of satellite operators, and a weighted average cost of capital and an annual depreciation rate are applied to the estimated replacement value of an operator's satellite fleet to estimate annual platform cost. This estimated cost is a proxy for the single-period, implicit annual economic rental cost of such assets.

²¹⁰ Estimated Network Costs were based upon the replacement value of the satellite fleet as of 12/31/2005 multiplied by a weighted average cost of capital of 8.5%, the average for the DTH firms as estimated by Bernstein, and an average depreciation rate based on a 12 year design life.

²¹¹ Discretionary costs in the numerator were calculated using sales, marketing, R&D, and programming costs contained in publicly-filed reports for relevant companies.

²¹² Intelsat, Ltd., Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 available at <http://www.sec.gov/edgar.shtml> (visited July 12, 2006); PanAmSat Holding Corp., Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 available at <http://www.sec.gov/edgar.shtml> (visited July 12, 2006); SES, Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 available at <http://www.sec.gov/edgar.shtml> (visited July 12, 2006); New Skies Satellites B.V., Annual Report on Form 10-K Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934 for the Fiscal Years ended December 31, 2001-2005 available at <http://www.sec.gov/edgar.shtml> (visited July 12, 2006).

²¹³ Possibly the most useful general bargaining models for understanding in broad terms satellite carrier and wholesale customer behavior are found in the literature on alternating offers over finite and infinite time. See, Arel Rubinstein, "Perfect Equilibrium in a Bargaining Model," *Econometrica* 50 (1982):97-110. A useful treatise covering numerous aspects of modern bargaining theory is Abhinav Muthoo, *Bargaining Theory With Applications* (Cambridge, UK: Cambridge University Press, 1999).

attributes of the bargaining environment that are predictive of the conduct of both satellite carriers and wholesale customers.²¹⁴

151. Negotiations between a satellite carrier and a wholesale customer are multidimensional and often include much more than just the pricing of transponder lease services. As we have discussed, specific technical aspects of coverage, power, and bandwidth likely come into play. Negotiations may also involve the terms and conditions of the transponder lease contract, including payment schedules, cancellation penalties, and legal issues, and other aspects of service delivery, including the nature and extent of customer support following contract execution. Both parties benefit from building and sustaining a workable, ongoing, and long-term commercial relationship, given the typical length of contract term for most transponder leases and the technical nature of the service, which may require adjustments and modifications as technology and the commercial requirement evolve.²¹⁵

152. The negotiated pricing of a transponder generally reflects relative bargaining power which is affected the customers' ability to select outside options, *i.e.*, other offers of service or economic benefit outside the current bargaining context that party may accept if negotiations in the present bargaining context breakdown. The price may also reflect the certain economic attributes of transponder transactions including asset specificity, *i.e.*, the degree that an asset can redeployed to alternative uses and by alternative users without substantial loss in productive service.

153. The bargaining power of the customer with credible outside options may constrain the satellite carrier from realizing much or any economic profit. Customers without credible outside options may still retain substantial bargaining power relative to the satellite carrier. To the extent that a satellite carrier has substantial excess transponder capacity or faces a highly uncertain demand for its services, then the satellite carrier may be willing to accept an offer that fails to cover its long run incremental cost.

154. The limited transponder lease rate data that exist for wholesale markets support our previous discussion of the prominence of investments in network versus operating costs.²¹⁶ As indicated above, the wholesale market for transponder capacity is characterized by bilateral negotiations between suppliers and customers. Asset specificity, combined with the bargaining power of purchasers (which reflects outside options), should be reflected in price differentials.

155. Table 7 presents the average lease rate per 36 MHz transponder, by region, for the years 2003 and 2004, in a way that permits examination of site specificity. The Table also reflects the regional excess supply of transponders for 2005, as those lease rates would reflect supply and demand considerations for the near future. With the exception of the Middle East and North Africa and somewhat with Latin America:²¹⁷ there is a high degree of correlation between excess supply and lease rates, indicating that the volume of outside options has a strong influence on market prices.

²¹⁴ This discussion addresses the major long-term contractual issues that are most directly related to investment decisions. We note that there may be other markets in which the dynamics of negotiation may differ somewhat, such as the spot market for transponder capacity for satellite news gathering, which relates to short-run needs of customers.

²¹⁵ As emphasized in transaction cost economics, such contracts are necessarily *incomplete*, and an adaptable mechanism is required to allow the resolution of new problems or disputes which may arise during execution of the contract. See Oliver E. Williamson, *The Economic Institutions of Capitalism* (New York: The Free Press, 1985), Chapter 2.

²¹⁶ See *supra* at ¶ 146-147.

²¹⁷ It should be recalled that there are a number of other factors besides outside options that will affect price.

TABLE 7
TRANSPONDER LEASE RATES AND EXCESS SUPPLY OF TRANSPONDERS

| <i>Region</i> | <i>2003/2004 Average Revenue/Transponder in Millions of \$</i> | <i>Excess Supply/Total Supply (2005)</i> |
|------------------------------|--|--|
| Western Europe | 3.02 | 30.7 % |
| Asia Pacific | 1.51 | 46.4 % |
| North America | 1.49 | 47.1 % |
| Sub Saharan Africa | 1.37 | 53.5 % |
| Middle East and North Africa | 1.41 | 28.3 % |
| Latin America | 1.36 | 38.8 % |
| Central Europe | 1.40 | 52.0 % |
| Russia and Central Asia | 1.31 | 52.6 % |
| Southern Asia | 0.87 | 55.7 % |

Source: *Euroconsult 2006 Report*.

B. Retail Markets

156. For retail markets with many customers, short term financial arrangements, and high customer mobility, substantial investments in advertising and programming are required to create and support a brand image and to enhance the customer's perception of value and willingness to pay for the product. Extensive customer support capability to retain and attract customers is also needed in such markets. These expenditures are both discretionary and significant in the retail markets.

157. Table 8 shows the proportion of network to operating investments for satellite carriers supplying the retail SDARS market, applying the same assumptions for estimating economic costs described above for wholesale markets. This Table relies on publicly filed company data for 2001-2005. The high level of operating to network costs is consistent with substantial investments spent on product development and customer acquisition.

| Satellite Carrier | Estimated Replacement Cost of Satellites (\$ millions) | WACC @8.5% Per Annum (\$ millions) | Depreciation@ 8.3% Per Annum (\$ millions) | Estimated Network Cost ²¹⁸ (\$ millions) | Ratio of Operating to Network Costs ²¹⁹ |
|-------------------|--|------------------------------------|--|---|--|
| XM | 1,040.0 | 88.4 | 104.0 | 192.4 | 3.1 |
| Sirius | 780.0 | 66.3 | 78.0 | 144.3 | 2.9 |

| ARPU | 2001 | 2002 | 2003 | 2004 | 2005 |
|--------|------|------|------|-------|-------|
| XM | n/a | n/a | 8.97 | 8.68 | 9.51 |
| Sirius | n/a | n/a | 9.48 | 10.16 | 10.34 |

V. MARKET PERFORMANCE

159. In the foregoing Sections, we have studied the structure of, and conduct in, the relevant markets for satellite communications services. In this Section, we apply those studies using publicly available industry data to evaluate how well these markets are performing for consumers. We discuss various tests that are commonly applied to evaluate market performance including the degree of competition and the presence of market power. The tests that we are able to apply, based on the available data, provide us with enough information to conclude generally that the markets analyzed are performing well, and that both wholesale and retail markets show evidence of price and quality rivalry.

²¹⁸ Based upon the replacement value of the satellite fleet as of December 31, 2005, multiplied by a weighted average cost of capital of 8.5%, the average for the DTH firms, as estimated by Bernstein, and an average depreciation rate based on a 12 year design life, as estimated by Futron Corp.

²¹⁹ Operating costs in the numerator were created using sales, marketing, R&D, and programming costs contained in publicly filed company reports.

²²⁰ XM and Sirius IO-Ks.

²²¹ Id.

A. Analytical Framework

160. Introduction. Good performance in a market is best described as an optimal mixture of efficiency in the use of resources, responsiveness to consumer demands, and innovation to produce improved services at lower prices.²²² One way to detect the presence or absence of these forms of ‘good performance’ in a market is to measure the presence of competition or, at the opposite extreme, market power. In a perfectly competitive market, no firm has the ability to charge prices above cost on a sustained basis and to earn ongoing ‘economic’ profits (revenues in excess of what is required to compensate all inputs of production for their opportunity costs). Such a market is likely to perform well for consumers. If, however, a firm can set its prices above its costs and earn economic profits for a sustained period of time, then the firm possesses market power.²²³ Such a market is likely to perform poorly for consumers. Between these two extremes lie many possible levels of competition. For example, market power can exist in a relevant market and that market’s performance may be sub-optimal relative to a theoretical benchmark of perfection, but ‘effective competition’ can be developing.²²⁴

161. Description of Economic Tests. In the following paragraphs, we discuss commonly used tests to measure both the degree of competition and the presence of market power. Some of these tests measure static conditions, such as the relationship between current prices and marginal costs. Other tests measure dynamic conditions, such as changes in market share, improvement in quality, and other indicators of innovation. Ultimately, we do not apply all of the tests to all the relevant markets, due in part to the unavailability of requisite data or the inappropriateness of some tests for certain types of markets.

162. Market Concentration. As described in Section III.D.2, a market’s concentration can be measured by calculating market shares or by calculating the HHI.²²⁵ As discussed in that Section, however, we do not find HHIs to be a meaningful indicator of competition in wholesale markets, but do apply it to retail markets. We assess concentration in wholesale markets by reviewing the percent of domestic transponder capacity in Table I0. We also calculate market shares and HHIs for SDARS in Table 13.

163. Profit-to-Sales Ratio. Another test of competition or market power in a relevant market is the ratio of profit over sales, either in one firm in the market or in all firms in the market. This test assumes that higher profits might indicate a level of market power in the relevant market. Some critics of this approach counter, however, that high profits may also result from remarkable innovation, superior service, governmental decisions, or historical accident. We use profit to sales ratios to measure

²²² See F.M. Scherer and David Ross, *Industrial Market Structure and Economic Performance* (Third Edition, Houghton Mifflin Co., Boston MA, 1990) 4-5.

²²³ Market power sustained over a substantial period of time often signals the existence of some impediment to market entry, although the impediment need not constitute a policy-relevant barrier to entry. A policy-relevant barrier to entry (1) is any cost that a potential entrant must incur in the course of market entry that an incumbent firm need not incur, and (2) implies a net loss in consumer welfare if the barrier persists. See *Annual Assessment of the Status of Competition in the Market for the Delivery of Video Programming*, First Annual Report, 9 FCC Rcd 7442, 7542 n.532, ¶ 205 (1994).

²²⁴ For example, the European Commission defines “effective competition” as a continuing absence of players with significant market power or a “dominant” position in the market. OECD, Working Party on Telecommunication and Information Services Policies, *Indicators for the Assessment of Telecommunications Competition* at 6 (Jan. 17, 2003), <http://www.oecd.org/dataoecd/4/22/2496809.pdf#search=%22%22european%20commission%22%20%20%2B%20%22continuing%20absence%22%20%2B%20%22significant%20market%20power%22%22> (visited Sept. 13, 2006).

²²⁵ See *supra* ¶¶ 69-71.

competition in the wholesale market in Table 11

164. The Lerner Index. Yet another test calculates the percentage difference between price and the marginal cost of production of a product or service at the profit-maximizing level of product on.²²⁶ The Lerner Index assumes that the prevalence over time of prices in excess of marginal costs often indicates the existence of market power.²²⁷ If the Lerner Index of a market is declining, we may infer that the market is moving towards a competitive condition. In this Report, we use Lerner Indices to measure competition in the markets for wholesale services in Table 12.

165. The Lerner Index establishes a direct relationship between market power and the own-price elasticity of demand, or the degree to which the demand for a product itself changes as its price changes. If the elasticity of demand for a firm's product is infinite, as it is in a perfectly competitive market, then the deviation of price from marginal cost is zero. As illustrated by the Lerner Index, the larger in absolute value the own-price elasticity of demand is, the smaller the divergence is between monopoly and competitive price (where competitive price is just equal to marginal cost in the absence of economies of scale).²²⁸ As the number of substitutes for a service increases, the elasticity of demand for its services will increase. Thus, even if competition in a market is between a few firms selling somewhat differentiated products, such rivalry may significantly increase the elasticity of demand for each of the rivals' services and eliminate significant deviations of price from marginal cost.

166. Consumer-Oriented Metrics. Competition and market power can also be detected indirectly in retail markets by calculating various metrics relating to consumer behavior, such as chum and ARPU. Chum is defined as the percentage of customers of a firm, or of all firms in a market, that change their service supplier in a given period of time. A low rate of chum in a market may indicate trapped customers and the presence of market power in one or more market participants. At the opposite extreme, a high rate of chum may indicate a competitive market in which consumers freely shift from one supplier to another in response to lower prices, higher quantities, or other attractive attributes of service offerings.²²⁹

167. ARPU is another metric widely used in retail communications businesses. Falling ARPU can indicate decreases in price or increases in the quantity of service offered at a given price, either of which may indicate increasing competition or, at least, improved market performance for consumers. In this Report, we discuss ARPU, chum and other consumer-oriented metrics to measure competition in those retail markets where sufficient data exist.

B. Data and Application of Analytical Framework

1. Domestic Wholesale Markets

168. Publicly available data concerning the satellite industry necessary to conduct the analysis by the various metrics described in paragraphs 161-167 above, exist only in part. For wholesale satellite

²²⁶ Dennis W. Carlton & Jeffrey M. Perloff, *Modern Industrial Organization* 4th Int'l Ed. (Wesley, 2005) 137,782; see also id. 195-96 (New York: Harper-Collins, 1994)

²²⁷ The Lerner Index is defined as $L = [(p \cdot MC)/p]$ where p and MC measure the unit output price and the marginal cost of production, respectively.

²²⁸ When measuring the extent of market power of a given firm, the market and the firm demand curves must be carefully distinguished. If the entire market is served by a single firm, i.e., a monopoly, then the market demand curve is equivalent to the firm demand curve. Under perfect competition, each firm's demand curve is perfectly elastic and the market demand curve does not coincide with the firm demand curve.

²²⁹ See, e.g., *Motion of AT&T Corp. to Be Reclassified as a Non-Dominant Carrier*, Order, 11 FCC Rcd 3271, 3305-07, ¶¶ 63-66 (1995).

services markets, the available public data are quite limited, in part because some market participants report their financial data as part of a larger corporate parent's filings and do not provide sufficiently disaggregated data. Other wholesale market participants are not publicly traded, and no data are publicly reported. As noted in the description of the markets for the various wholesale services, these markets typically involve relatively few large purchasers of capacity. Because they can effectively bargain with satellite operators (unlike the large number of individual consumers in retail markets), measures of market concentration such as HHIs lose the meaning they might lend to retail markets. Additionally, the data available do not reflect the recent mergers of Intelsat with PanAmSat and New Skies with SES.

169. Many satellite operators are not, and have not been in recent years, publicly traded companies. Others do not disaggregate their financial data from that of their corporate parent company. This makes computation of comparable performance indices impossible. Several firms that operate global systems, essentially operators of fixed satellites, provide detailed financial data, but only on a consolidated, global basis, and not separately for the U.S. domestic market. As the domestic market, however, generally accounts for some 70% of global wholesale satellite revenues,²³⁰ we have computed the various financial measures, understanding that these measures based on globally consolidated data can only serve as proxies for domestic data. In addition, a number of operators entered bankruptcy during the study period (with some exiting), particularly those in the mobile satellite services market, creating a high degree of fluctuation for some metrics.

170. For this Report therefore, we utilize data developed by the Futron Corporation for the capacity-related wholesale markets examined in this study. These data portray the use of transponders in the domestic market by the major operators prior to recent transactions, as well as some globally consolidated financial data that can serve as proxy indicators of competition in the domestic market. For the network services market, we provide industry revenue information to illustrate the dynamics of the VSAT and teleport sectors.

171. Wholesale Market Shares. Given the cost characteristics and the dynamics of market demand, all wholesale market segments appear to be performing well. Our review of available data on shares of satellite capacity shows that four firms held 80 percent of the domestic transponders activated (Intelsat, SES Americom, PanAmSat and New Skies), with the remainder provided by Loral Skynet and other foreign-licensed operators. Subsequent to the collection of these data, Intelsat and PanAmSat merged, and SES and New Skies merged. We find relatively high profitability ratios for the major wholesale market participants but limited and declining market power based on Lerner Index proxy measurements. This may be due to the wholesale customer's strong bargaining power in establishing price and ongoing price rivalry among the remaining firms in the wholesale market, as well as terrestrial competition in certain wholesale markets. We also note that participants in the Network Services markets continue to post significant revenues, even as they are experiencing increased competition from terrestrial providers where wireline solutions are geographically available.

172. As noted in paragraph 71 above, the use of an HHI in markets in which there are few, large purchasers is of limited value due to the countervailing power between supplier and purchaser. Table 10 displays the major participants' shares of transponders activated in domestic markets.

²³⁰ See SIA/Futron Study at 8-11. An exception to this industry average is SES Americom, which does provide data. That data indicate, however, that its net income is 21% of that of SES Global.